

7. International Activities, 1993

In July, Eldon Ferguson attended and participated in the International Symposium on Modern Chemistry in Beijing, China. In November, he lectured at the Department of Chemistry and interacted and collaborated on research in atmospheric ion chemistry and air-sea exchange of CO₂ at the University of Canterbury, Christchurch, New Zealand.

In April, Russ Schnell spent 1 week in northern Siberia at Cherskiy, Russia, co-leading a group of NOAA, EPA, and DOE scientists and administrators in a research logistics demonstration project. The group flew on chartered Russian aircraft including an AN-74 (jet), AN-26 (twin turboprop), and AN-2 (single engine biplane) to test the aircraft capabilities for future Arctic air research projects. Doug Guenther, also a member of the group, determined the feasibility of utilizing Russian aviation resources to carry out flask sampling of trace gases. Russ Schnell attended the International Global Aerosol Program workshop in Geneva, June 28-July 2, 1993, as a member of two Expert Panels drafting the overall IGAP program plan. October 4-8 Russ Schnell attended and presented papers on AGASP and CMDL Arctic meteorological data sets at the International Symposium on the Ecological Effects of Arctic Air Contaminants, Reykjavik, Iceland.

Bernard Mendonca traveled to Geneva, Switzerland, in January to attend the first organizational meeting for the establishment of the WMO GAW stations. In March he traveled to Munich, Germany, to attend the Harmonization of Environmental Measurement (HEM) Programme and Technical Advisory Group Meeting as a member of the programme and technical advisory group of the United Nations Environment Programme (UNEP). In March and April Bernard traveled to Buenos Aires, Argentina, and Sao Paulo, Brazil, to continue in the organization and establishment of GAW stations. Bernard traveled to Geneva in June and again in October to aid the WMO Secretariat staff in station logistics and purchasing of equipment for the GAW stations.

In April and May, Dave Hofmann traveled to Oberpfaffenhofen, Germany, to discuss research results at the Institute for Atmospheric Physics. D. Hofmann presented a paper entitled "Twenty years of balloonborne tropospheric aerosol measurements at Laramie, Wyoming" at the First International Global Atmospheric Chemistry Program (ICAG) Scientific Conference in Eilat, Israel. Next, he visited the Institute for Atmospheric Environment Research in Garmisch, Germany, to conduct research and present a paper entitled "Possible impact of the commercial jet fleet on the upper tropospheric aerosol" at the XVIII General Assembly of the European Geophysical Society in Wiesbaden, Germany. D. Hofmann then visited the Max Planck Institute (MPI) in Heidelberg before attending the MPI sponsored IPCC WGI Workshop on

The Impact on Climate of Ozone Change and Aerosols held in Hamburg.

D. Hofmann attended two WMO meetings. The first was the June meeting of the Stratospheric Aerosol working group of the International Global Aerosol Program at WMO headquarters in Geneva, Switzerland. The second meeting was comprised of authors for the United Nations Environment Program Ozone Trends Report and was held in September in Cambridge, England. In late October and early November, D. Hofmann attended a meeting at the CSIRO Cape Grim Baseline Air Pollution Station in Hobart, Tasmania, Australia.

H. Vömel participated in the NATO Advanced Study Institute on Low Temperature Chemistry of the Atmosphere in Maratea/Sapri, Italy. He presented a paper entitled "Balloon-borne observations of stratospheric and upper tropospheric water vapor in the tropics and over Antarctica." While in Europe, H. Vömel also visited Grossforschungsanlage in Jülich, Germany, to work with Dieter Kley on the use of their atmospheric test for calibrating ozonesonde pumps and the frost-point hygrometer. M. O'Neill accompanied H. Vömel to carry out balloonborne water vapor and ozone measurements from aboard the research vessel *John H. Vickers*.

Mike O'Neill visited Christmas Island, Republic of Kiribati, on March 18-29 and Terciera, Azores, on July 28-September 9 to discuss CO₂/CH₄/CO sampling with local sample takers.

The University of Stockholm invited John Ogren to present a seminar "Measurements of the size-dependence of the scavenging efficiency of aerosol particles by fog droplets" in January. While in Sweden, John consulted with colleagues on the measurements done at the Swedish baseline station on Spitsbergen and worked with faculty and students on evaluation of cloud/aerosol measurement data.

In September, Sam Oltmans attended a workshop on European Ozonesonde Records and presented results on North American ozonesonde trends in Jülich, Germany.

B. Evans and W. D. Komhyr traveled to Hradec Kralove in the new Czech Republic to attend the Dobson Workshop and Intercomparison in May.

In June, W.D. Komhyr attended the High Latitude Optics Symposium in Tromsø, Norway, to present an invited paper entitled, "U.S.A. Dobson Spectrophotometer Total Ozone Program, 1962-1992." In November, W.D. Komhyr traveled to Thessaloniki, Greece, to participate in a WMO Meeting of Experts on Homogenizing Total Ozone Records for Ozone Assessments and Early Warning of Ozone Changes.

B. Bodhaine and J. Wendell traveled to the remote Sable Island Regional Climate Monitoring Station off the coast of Newfoundland, Canada, in July to install new and to test and calibrate existing aerosol instrumentation. In late October, J. Wendell installed a

new solar radiation data acquisition system at South Pole, Antarctica.

M. Lucarelli from Australia (CSIRO) and R. Knoben from New Zealand (NIWA) worked with D. Guenther from April to June to build four of the CMDL-design aircraft sampling apparatus. Under an agreement, CSIRO and NIWA each received a complete sampling system.

In May, L. Haszpra from the Institute for Atmospheric Physics in Budapest, Hungary, came to Boulder for 25 days. The purpose of the visit was to prepare a paper for presentation at the 4th International Conference on CO₂.

Pieter Tans, Jim Peterson, and Michael Trolier attended the WMO CO₂ Experts Meeting held on September 6-11 in Rome, Italy.

Peter Bakwin, Philippe Ciais, Jim Peterson, Pieter Tans, and Michael Trolier participated in the 4th International CO₂ Conference in Carqueiranne, France, on September 13-17. Each presented a paper (see Publications and Presentations).

The program to bring flask-sampling network personnel to Boulder was continued. In preparation for establishing a sampling site in Malta, H. Galea from the Ministry of Environment, Pollution Control Coordinating Unit, Vittoriosa, visited Boulder September 8-12. Likewise, H. Muñoz, Direccion Meteorologica de Chile, was invited to Boulder in connection with establishing a cooperative program for collecting air samples on Easter Island. Sampling began in January 1994. Taking advantage of his trip to Washington, DC, arrangements were made for D. Dagvadorj, Mongolian Hydro-Meteorological Research Institute, to make a side trip to Boulder on December 18-21 to discuss the results to date of sampling for about 2 years at Ulaan Uul.

The South China Sea air sampling aboard the Chevron tanker *Carla A. Hills* terminated in February after 19 months of continuous collections. The vessel's charter was not renewed by Caltex. The Blue Star Line vessels, *Wellington Star* and *Southland Star* were withdrawn from trans-Pacific service in July and August, respectively. L. Waterman traveled to Los Angeles to join the Blue Star Line vessel *California Star* on October 16-31 to train ship's officers to collect air samples and to restart Operation Pacific Air that had been in hiatus since August. The practice of collecting samples at 5° latitude intervals will be continued and a single pair in the middle of the Tasman Sea for each crossing was added to the protocol. L. Waterman disembarked at Botany Bay, NSW, and visited Glass Expansion Pty. Ltd., Hawthorn, Victoria, and CSIRO, Aspendale, Victoria, on November 2. Glass Expansion manufacturers one of the best glass o-ring seal valves currently on the market. From November 12-26, L. Waterman sailed on the *Great Promise* from Singapore to Hong Kong and return to restart the South China Sea program. The protocol for collecting pairs of evacuated samples every 3° of latitude on all runs, north and south, was reestablished.

P. Novelli continued intercomparisons of CO standards begun in 1991. The current round of comparisons, begun in July, involves ten laboratories in eight countries and will be completed in January 1995. Four cylinders of standard gases are being sent from one collaborator to the next in Australia, Brazil, Germany, Hong Kong, Japan, New Zealand, South Africa, and the United States (Colorado, Maryland, and Virginia). The objective of the intercomparisons, sponsored by NASA, is to create an internally consistent set of ground based measurements to which measurements from space can be compared.